ESO 1581

Farm Management Principles

I. Factors of Production

The Production Function
Historical Perspective
What Is Management?

II. Decision-Making

Process
Principles

III. Decision-Making

Information
Techniques

IV. Resource Acquisition

Size Economics
Capital and Credit
Buy vs. Lease

V. Resource Use

Enterprise Selection
Efficiency

by

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I. FACTORS OF PRODUCTION

The Production Function

Historical Perspective

What Is Management?

A. The Production Function

1. Mathematical Formulation

y =

x =

f =

2. Graphical Representation

B. Historical Perspective

1. Greek Philosophers

a. Aristotle (384-322 B.C.)

b. Prohibition of Usury

c. Religious Perceptions

d.

2. French Physiocrats (1700's)

a. Industry and Commerce Were Unproductive

b. Land and Land Products Were Only Real Wealth

c. Prosperity Rested on Freedom

d.

3. English Political Philosophers (1700's)

a. Determinants of Prices

b. Concept of Rent

c. Profit Generation

d.

4. Marxian Philosophy (mid-1800's)

a. Factory System of Production

b. Exploitation

c. Labor Theory of Value

d.

5. Marginal Economists (late 1800's/early 1900's)

a. Mathematicians

b. Application to Production

c. Marginal Theory of Distribution

d.

6. Austrian Economists (turn of century)

a. Factors of Production

b. Original Factors

c. Produced Factors

d.

7. Current Economics (20th Century)

a. Same Factors Yield Different Results

b. A Second Produced Factor

c. Managerial Revolution

d.

C. What Is Management?

1. Frequently-Heard Cliché
   a. "The Key to Success"
   b. "Difference Between Success and Failure"
2. Nebulous Definitions
   a. Art and Science
   b. Combining: Ideas, Facilities, Materials, ...
   c. For a Profit
3. Useful Farm Definition

II. DECISION-MAKING

Process

Principles

A. The Decision-Making Process

1. What Makes a Farmer Successful?

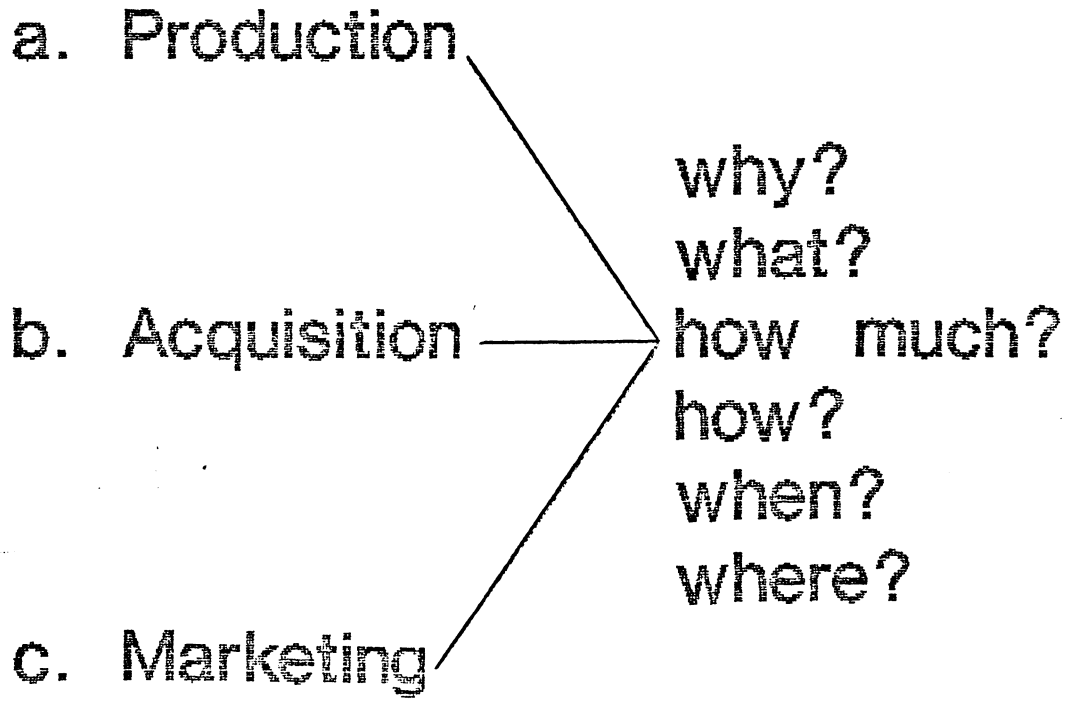
a. Mechanical Abilility?

b. Agronomist?

c. Animal Scientist?

d. Managerial Abilility?

2. Managerial Decisions



3. Decision-Making Steps

   a. Set Goals

   b. Problem Recognition

   c. Gather Information

   d. Assessing Alternatives

   e. Decide

   f. Take Action

   g. Accept Responsibility

   h. Evaluate Decision

B. Fundamental Economic Principles

1. Production Concepts

a. Fixed and Variable Factors

b. Diminishing Returns

1) Added Output from Added Input Decreases

2) Results from Fixed Factors

3) Graphic Representation

c. Factor Substitution

1) Different Combinations Yield Constant Output

2) Substitution Ratio Changes

3) Graphic Representation

d. Product Combinations

1) Same Factors Can Produce Different Products

2) Competing Factor Use

3) Graphic Representation

2. Cost Concepts

a. Cash/Non-Cash

1) Out-of-pocket
2) Opportunity
3) Depreciation

b. Fixed/Variable

1) Avoidance and Variation
2) Total, Average, Marginal
3) Graphic Representation

3. Revenue Concepts

   a. Total

   b. Marginal

4. Profit Concepts

   a. Marginal Revenue = Marginal Cost

   b. Equal Marginal Revenues

   c. Least-Cost Combination of Factors

   d. Most Profitable Combination of Outputs

III. DECISION-MAKING

Information

Techniques

A. Information Needs

1. Accounting

a. Information Generation

1)

2)

b. Permits

1) Understanding
2) Application of Principles
3) Performance and Analysis
4) Financial Statements

c. Necessary for Problem Solving

2. Performance Factors and Measures

a. Isolate Strengths and Weaknesses
b. Limitless Set
c. Useful Set for High Priority Problems

1)
2)
3)
4)
5)
6)

d. Use Several Factors
e. Focus on Impact Factors

3. Standards for Comparison

a. Comparison Necessary

1) Good/Bad
2) High/Low

b. Objectives Will Vary

1)
2)
3)
4)

c. Develop Own Objectives

d. Sources

1)
2)
3)

B. Techniques

1. Budgeting: Testing Alternatives

a. Answer 3 Questions

1)

2)

3)

b. Types of Budgets

1) Partial

2) Total Farm

3) Cash Flow

4) Enterprise

C. The Partial Budget

1. Test Affected Part of Business

2. Outline

D. Investment Analysis

1. Time Value of Money

a)

b)

c)

2. Compounding

3. Discounting

4. Net Present Value

a. Steps

1) Investment to Analyze

2) Initial Cash Outlay

3) Annual Net Cash Flows

4) Discount Rate

5) NPV's

6) Decide

b. Method

Item	Years				
	0	1	2	3	4
Cash Flow					
NPV					

c. Issues

1)
2)
3)
4)
5)
6)
7)

d. Interpretation

1) + NPV Not Necessarily Best

2) Compare Only = Planning Periods

3) Compare Only = Size Projects

4) Assumption

5) Financial Feasibility

IV. RESOURCE ACQUISITION

Size Economics

Capital and Credit

Buy vs. Lease

A. Size Economics

1. Size Change

a.
b.
c.
d.

2. General Cost-Size Relationship

3. Technical Economies of Size

a. Only Affect Costs

b. Cost Per $ Gross Income

Corn Belt Grain Farms

	Farm A	Farm B	Farm C	Farm D
Cropland	77	141	272	639
Total Cost Average	.66	.62	.59	.51

4. Price Economies of Size

a. Input Price Discounts

Discounts by Farm Size, Ohio
Acres

	100-179	260-499	1000+
	. . . % Discount . . .		
Seed	2.4	4.3	10.8
Fertilizer	2.2	2.8	6.6
Chemicals	1.4	2.2	7.8
Machinery	1.3	3.8	7.9

b. Product Price Premiums

5. Managerial Economies of Size

a. Labor Management

b. Overall Management

B. Capital and Credit

1. How Much Capital?

a. Equate Marginal Return with i

b. Relationship

2. Allocation of Capital

a. Principal: Equimarginal Returns

b. Budgeting and NPV

3. Acquisition Methods

   a. Owner Equity

   b. Debt

   c. Outside Equity

   d. Lease/Rent

4. How Much Credit

   a. Max = Borrowing Capacity

   b. Maintain Credit Reserve

   c. Profit/Risk/Capacity

5. Leverage

	A	B
Total Assets		
Debt		
Net Worth		
Leverage		

6. Leverage and Profit

	Leverage Ratio	
	0.0	1.0
Net Worth		
Debt		
Total Assets		
ROA		
R to A		
Cost of Debt (12%)		
R to HW		
ROR to NW		

7. Leverage and Risk

	Leverage Ratio	
	0.0	1.0
Net Worth		
Debt		
Total Assets		
ROA		
R to A		
Cost of Debt (12%)		
R to NW		
ROR to NW		

8. Repayment Capacity

a. Loan Length and i

Repayment Capacity Per $1,000 Available

Repayment Years	Interest Rate 10%	14%
1	$ 909	$ 877
5	3791	3433
10	6145	5216
20	8514	6623

b. Estimating Repayment Capacity

	Net Farm Income	60,000
+	Depreciation	+20,000
+	Interest Paid	+15,000
-	Family Living	-20,000
-	Income Tax	-10,000
-	Current Loan Payments	-40,000
-	Down Payments	- 5,000
+	Non-Farm Income	+ 3,000
+	Gifts, etc.	+ 0
=	Repayment Capacity	=17,000

C. Buy vs. Lease

1. Land

a. Which To Do?

1) Preference to Own
2) Preferred Loan Security
3) Windfall Gains/Losses
4) Flexibility
5) Expansion
6) Risk
7) Changing Economy
8) Land Security
9) Living Conditions
10) Financial Situation

b. Purchasing

1) Max Bid: Profitability

2) Max Bid: Feasibility

3) Risk

4) Ownership Cost

c. Lease

1) Local Custom

2) Fairness

3) Profitable

4) Market

5) Lease Costs

2. Machinery

a. Purchase

1) Ownership Costs

DIRTI 5

2) Operating Costs

3) Total Cost Per Acre

b. Lease

1) Control Without Owning

2) Not Widely Used

3) Not Renting

4) Use Situations

-

-

-

-

c. Use NPV to Decide

Purchase

Item	Year 0	1 5	
Purchase	50,000	0	0
Income Tax	0	-7,280	-3,192
After Tax CF	50,000	-7,280	-3,192
Discount F	1.0	.9091	.6209
PV			
NPV			

Lease

Item	Year 0	1 5	
Lease	11,500	11,500	5,000
Income Tax		-3,700	-3,700
After Tax CF	10,000	7,800	1,300
Discount F	1.0	.9091	.6209
PV			
NPV			

V. Resource Use

Enterprise Selection

Efficiency

A. Enterprise Selection

1. Determinants of Production

a. Physical

Climate
Topography
Soils
Biology

b. Economic

Comparative Advantage
Competitive Advantage

c. Process

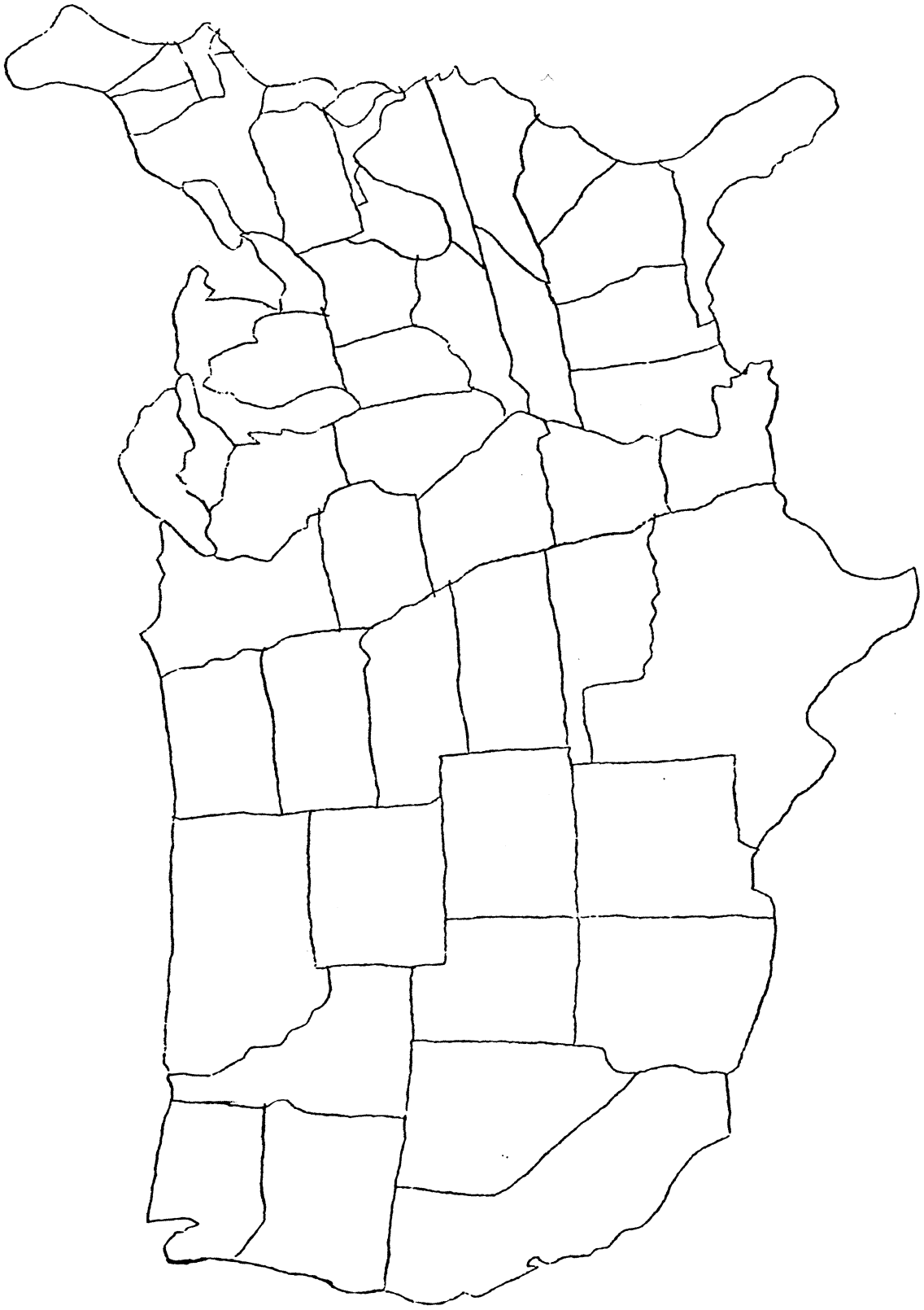
2. Location

a. What Have Farmers Decided?

1) World

2) U.S.

3) Ohio



3. Comparative Advantage

a. Principle

"Produce That Product Where Your Production Advantage Is Greatest or Your Disadvantage Is Least"

b. Illustration

	Illinois	Kansas
Wheat (bu)	50	30
Corn	120	60
Ratio	2.4	2.0

c. Sources

4. Competitive Advantage

a. Principle

"Produce That Product Which Has Lowest Opportunity Cost"

b. Illustration

c. Source

5. Enterprise Combination

a. Common Sense

1) Identify Resources

2) Enterprise Examination

3) Choose Most Profitable

4) Next Most Profitable

5) Add Others

b. Linear Programming

1) Elements of Solution

Enterprise Choices

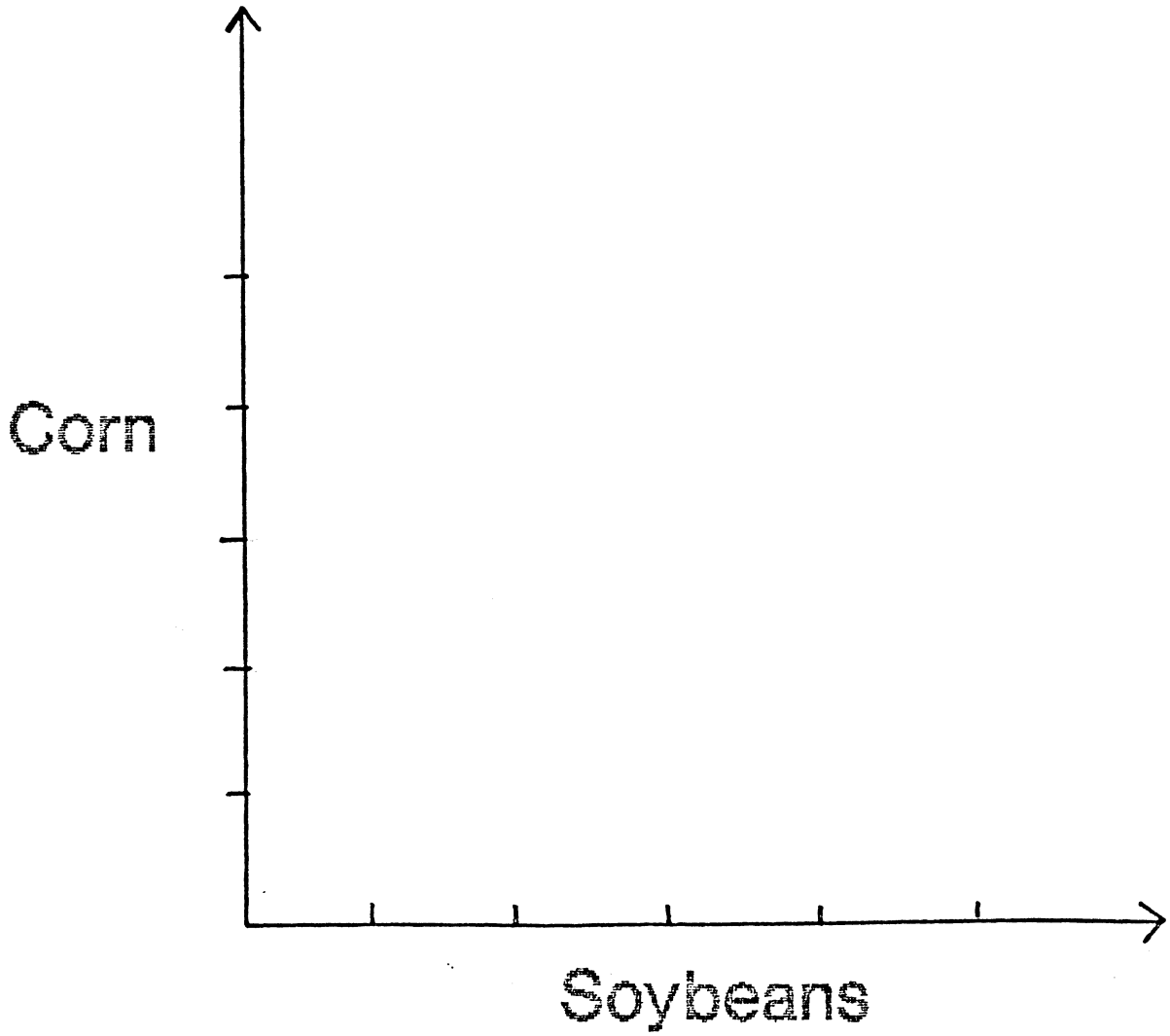
Resources

Requirements

Limits

Net Returns Per Acre

2. Graphical Presentation



B. Efficiency

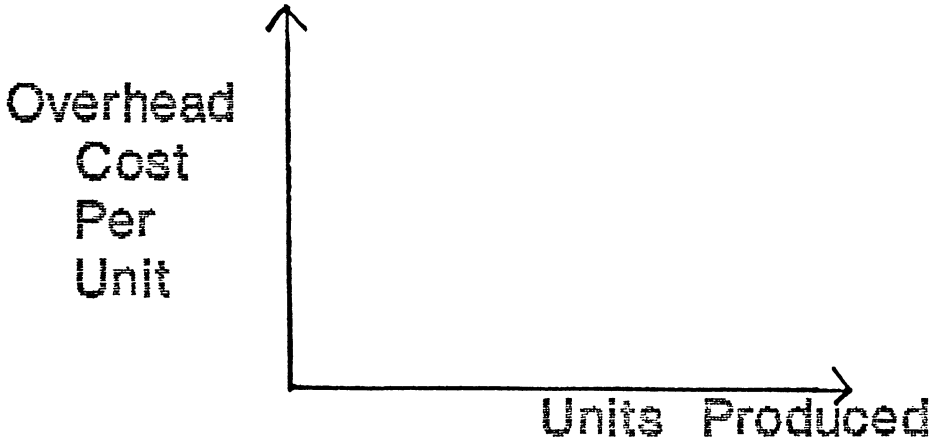
1. Definition

2. Inputs

3. Outputs

4. Principles

a. Fixed Inputs



b. Variable Inputs

1) Not Maximum Output Per Unit

2) Marginal Cost = Marginal Revenue

N	N Cost	MC	Yield	MR
30	$ 6.00		40.0	
40	8.00		41.0	
50	10.00		41.5	
60	12.00		41.75	